GERMAN TELECOMMUNICATIONS SATELLITE (DEUTSCHER FERNMELDE SATELLIT) (DFS-1 AND -2)

(Reimbursable)

TDS Mgr: N. Fanelli
NOPE: R. Nevarez

Project Mgr: H. Schmeller (GSOC)
MOM: G. Hiendlmeier (GSOC)
LV/Range: Ariane/CSG

Launch Date: Launched June 5, 1989; Launched July 24, 1990; July 1992
Projected SC Life/DSN Support: 10.1 years/30 days

D0945599

Project Responsibility: Research Agency for Aerospace Technology, Germany (DLR)

Source: SIRD December 1985/1989
Sponsor: DLR

A. MISSION DESCRIPTION

The German Telecommunications Satellite (DFS) program is to provide telecommunications service for high data rate transmission of text and video data to the Federal Republic of Germany within the 11 GHz to 14 GHz and 20 GHz to 30 GHz bands. The space segment of this program is composed of three satellites, DFS-1, DFS-2, and DFS-3, which will be located at 23.5°E longitude of the geostationary orbit.

B. FLIGHT PROFILE

The DFS will be launched from the Centre Spatial Guyanis in French Guiana on an Ariane launch vehicle. The mission follows the typical injection

sequence; i.e., parking orbit, transfer orbit, and drift orbit. Attitude maneuvers will be performed to orient the spacecraft prior to Apogee Kick Motor (AKM) firing. After AKM firing, drift phase orbital and attitude maneuvers will be performed to place the spacecraft in its final geostationary position.

C. COVERAGE

The DSN will support the transfer and drift orbit mission phases. The USAF IOS station will provide early support to DFS pre-Canberra AOS.

1. Coverage Goals

The coverage will consist of the 26-m initial acquisition at Canberra followed by 34-m support at Goldstone and Canberra as prime support for the transfer and drift orbits. Maximum support will consist of two 8-hour tracks per station for a 9-day period, plus 14 days of contingency support.

2. Network Support

The support provided by the DSN is indicated in the following table:

System	Goldstone	Canberra	Madrid
	12 14 15 16	42 43 45 46	61 63 66
S-band TLM	P	P *	$\overline{O}$
S-band CMD	P	P *	$\overline{O}$
S-band TRK	P	P *	$\overline{O}$

NOTE: P = Prime
O = Option
*26m S-band support for initial acquisition

3. Compatibility Testing

CTA 21 and GSFC test van will support compatibility testing with the DFS S/C TT&C "suit-case" model at approximately launch minus 7 months. These tests will verify and test the spacecraft RF compatibility with the DSN.

D. FREQUENCY ASSIGNMENTS

Frequencies are allocated according to the following table:

System	Uplink (MHz)	Downlink (MHz)	Polarization
S-band TLM	--	2201.600	RCP
S-band CMD	2027.752	--	RCP
S-band TRK	2027.752	2201.600	RCP

E. SUPPORT PARAMETERS

The support parameters for the Telemetry, Command, and Support Systems are listed below:

(1) Telemetry

Data Streams	1
Format	PCM(SP-L)/PSK/PM
Subcarrier Frequency	32768 Hz
Bit Rate	512 b/s
Record	Required

(2) Command

Format	PCM(NRZ-L)/PSK/PM
Bit Rate	500 b/s
Subcarrier Frequency	8000 Hz

(3) Support

Uplink Power	1 to 10 kW
Antenna Rate	Moderate
Antenna Angle Data	Required
Antenna Autotrack	Required (26-m antenna, only)
Doppler Rates	Modest
Range Format	Tone (100 kHz major tone)
Recording	
. Analog	Required
. Digital	Required

F. TRACKING SUPPORT RESPONSIBILITY

The allocation of responsibilities for tracking support is listed in the following table:

Mission Phase	Support Responsibility
Ariane Launch	CSG
Transfer/Drift Orbits	DSN
Geostationary Orbit	DFVLR

(This page intentionally left blank.)